



**“Designing answers that go beyond the expectations of Hydromet professionals to support them in caring for the world’s water”**

**Dave Procyk and Ken LaBar  
from Hach Company**

# Hach Environmental Portfolio of Brands

Hach Flow  
& Sampling



Hach ETS



Quality  
Quantity



Long Term/  
Nutrients



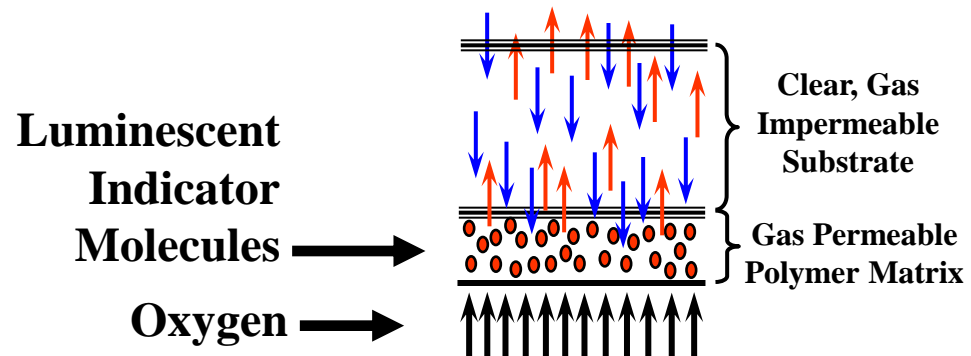
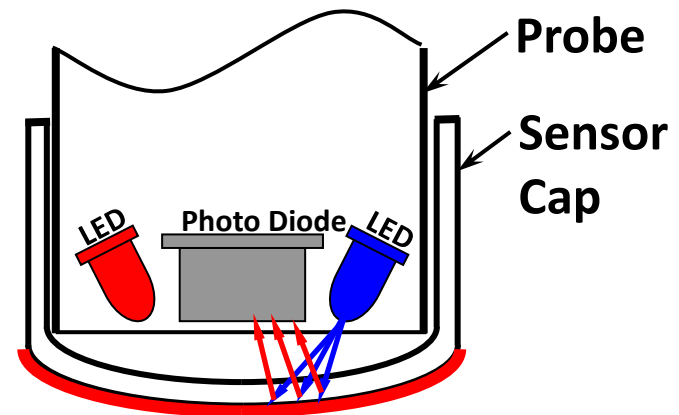
Location	Loveland	Elkhart	Loveland	Kempton	Bellevue
Products	Open Channel Flowmeters, Automatic Samplers	Test Strips (Pool & Spa, Medical)	Water Quality - Natural Waters	Water Quantity - Natural Waters	Oceanographic CTD Nutrients

- Ken LaBar
  - Hach Hydromet (Hydrolab group)
  - Responsible for LDO characterization
  - Responsible for new product embedded firmware

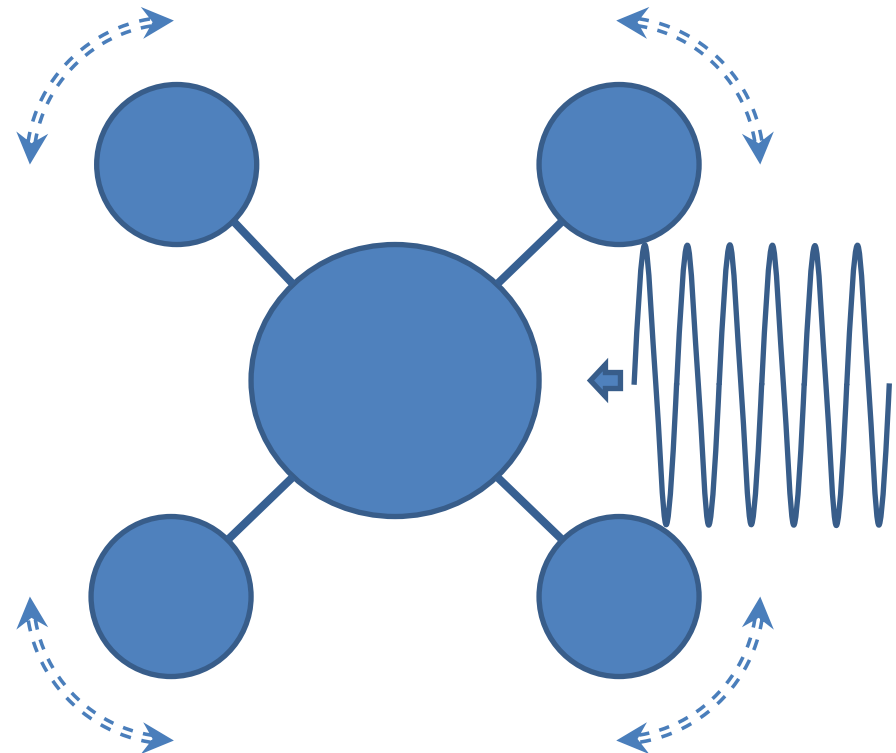
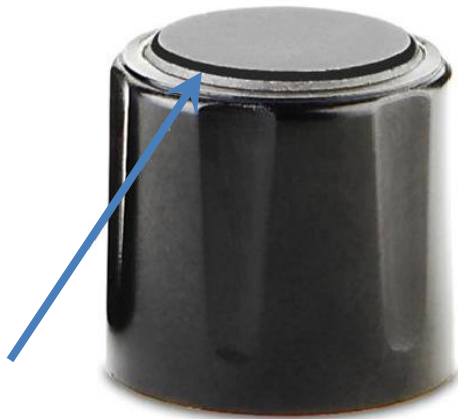
- 4:15 Welcome
- 4:18 LDO Sensor Basics
- 4:20 LDO Lumiphore Basics
- 4:25 Hach Cap Testing
- 4:30 Field Calibrations
- 4:35 Q&A

# LDO Sensor

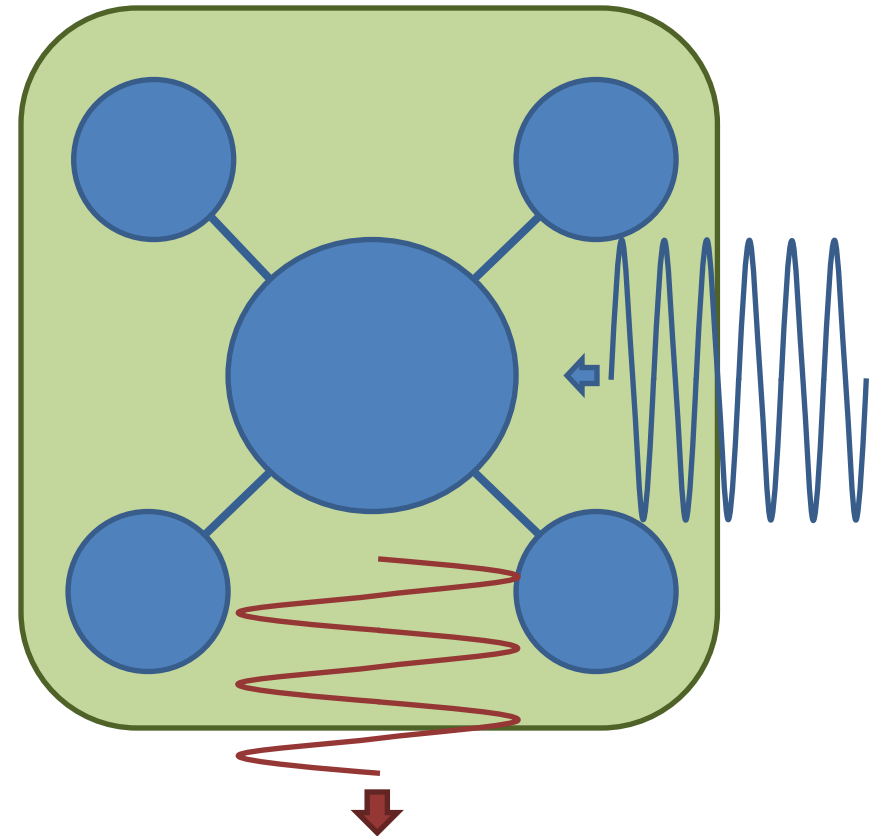
- LDO Sensors shine a light onto a luminescent indicator
- The response to the light is measured and compared against a calibrated curve
- Oxygen changes the response, indicating how much Oxygen is present



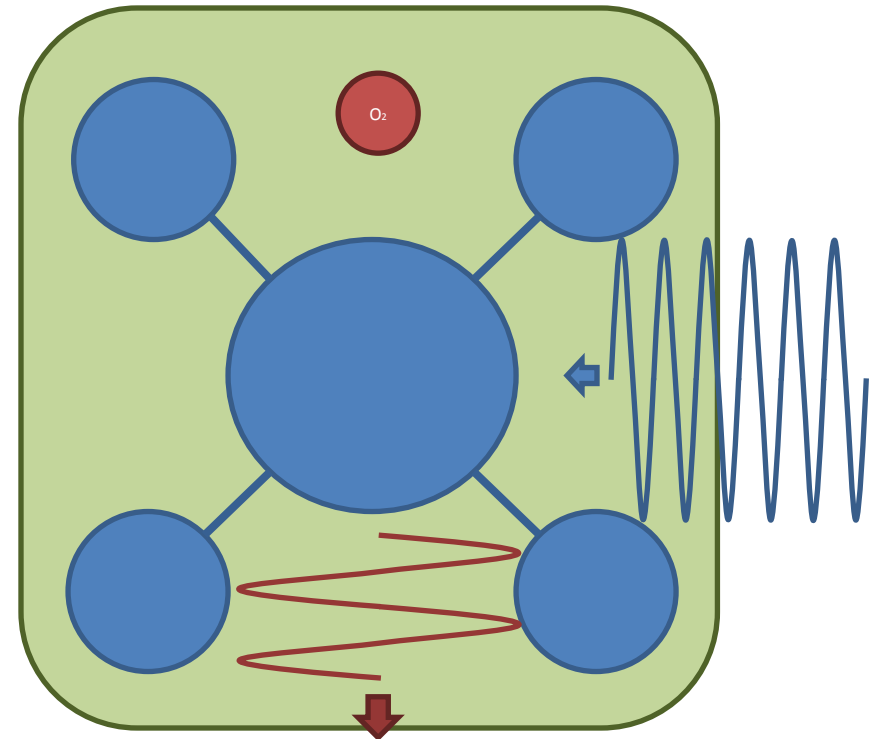
- Compound with “arms”
- Vibrates in response to light energy



- Encase lumiphore in polymer
- Lumiphore can not vibrate
- Energy released as light

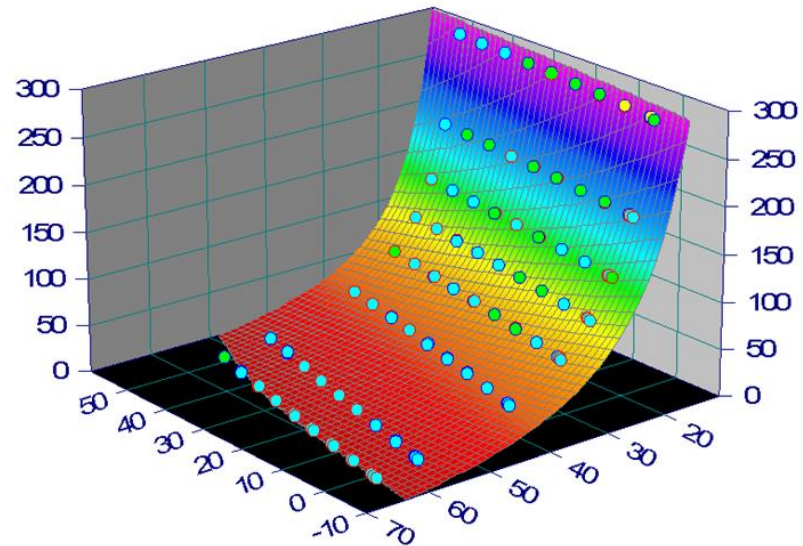
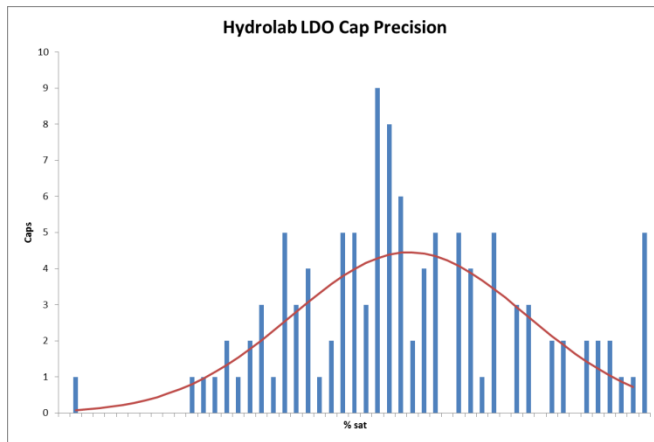


- Oxygen dampens energy
  - AKA: “Quenching”
- Light energy reduced
- LDO sensor measures change in energy





- Hach ensures consistency by:
  - Measure Every Cap (precision)
    - Outliers are thrown out
  - Characterize Every Lot (accuracy)
    - A repeatable Lumiphore
    - Measured against released curve fit



- Field calibration
  - Fine tunes measurement accuracy
- Zero calibration not required
  - Hach ensures zero before cap leaves factory
  - Concerns with Cobalt impregnating sensor
  - Dampens the response of the sensor for all future readings

